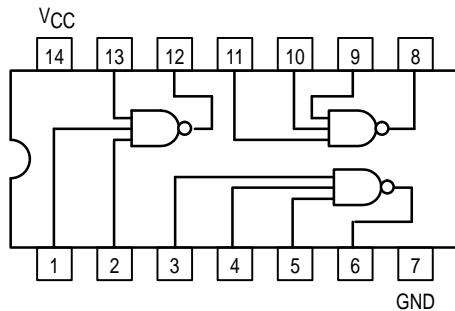




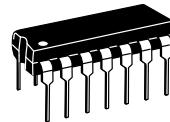
**MC74AC10  
MC74ACT10**

## Triple 3-Input NAND Gate

- Outputs Source/Sink 24 mA
- 'ACT10 Has TTL Compatible Inputs



TRIPLE 3-INPUT  
NAND GATE



N SUFFIX  
CASE 646-06  
PLASTIC



D SUFFIX  
CASE 751A-03  
PLASTIC

### MAXIMUM RATINGS\*

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	DC Supply Voltage (Referenced to GND)	-0.5 to +7.0	V
V <sub>in</sub>	DC Input Voltage (Referenced to GND)	-0.5 to V <sub>CC</sub> +0.5	V
V <sub>out</sub>	DC Output Voltage (Referenced to GND)	-0.5 to V <sub>CC</sub> +0.5	V
I <sub>in</sub>	DC Input Current, per Pin	±20	mA
I <sub>out</sub>	DC Output Sink/Source Current, per Pin	±50	mA
I <sub>CC</sub>	DC V <sub>CC</sub> or GND Current per Output Pin	±50	mA
T <sub>stg</sub>	Storage Temperature	-65 to +150	°C

\* Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

# MC74AC10 MC74ACT10

## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Min	Typ	Max	Unit
V <sub>CC</sub>	Supply Voltage	'AC	2.0	5.0	6.0	V
		'ACT	4.5	5.0	5.5	
V <sub>in</sub> , V <sub>out</sub>	DC Input Voltage, Output Voltage (Ref. to GND)		0		V <sub>CC</sub>	V
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time (Note 1) 'AC Devices except Schmitt Inputs	V <sub>CC</sub> @ 3.0 V		150		ns/V
		V <sub>CC</sub> @ 4.5 V		40		
		V <sub>CC</sub> @ 5.5 V		25		
t <sub>r</sub> , t <sub>f</sub>	Input Rise and Fall Time (Note 2) 'ACT Devices except Schmitt Inputs	V <sub>CC</sub> @ 4.5 V		10		ns/V
		V <sub>CC</sub> @ 5.5 V		8.0		
T <sub>J</sub>	Junction Temperature (PDIP)				140	°C
T <sub>A</sub>	Operating Ambient Temperature Range		-40	25	85	°C
I <sub>OH</sub>	Output Current — High				-24	mA
I <sub>OL</sub>	Output Current — Low				24	mA

1. V<sub>in</sub> from 30% to 70% V<sub>CC</sub>; see individual Data Sheets for devices that differ from the typical input rise and fall times.

2. V<sub>in</sub> from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

## DC CHARACTERISTICS

Symbol	Parameter	V <sub>CC</sub> (V)	74AC		Unit	Conditions
			T <sub>A</sub> = +25°C	T <sub>A</sub> = -40°C to +85°C		
			Typ	Guaranteed Limits		
V <sub>IH</sub>	Minimum High Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	2.1 3.15 3.85	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
V <sub>IL</sub>	Maximum Low Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	0.9 1.35 1.65	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
V <sub>OH</sub>	Minimum High Level Output Voltage	3.0 4.5 5.5	2.99 4.49 5.49	2.9 4.4 5.4	V	I <sub>OUT</sub> = -50 μA
		3.0 4.5 5.5		2.56 3.86 4.86	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> -12 mA I <sub>OH</sub> -24 mA -24 mA
V <sub>OL</sub>	Maximum Low Level Output Voltage	3.0 4.5 5.5	0.002 0.001 0.001	0.1 0.1 0.1	V	I <sub>OUT</sub> = 50 μA
		3.0 4.5 5.5		0.36 0.36 0.36	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> 12 mA I <sub>OL</sub> 24 mA 24 mA
I <sub>IN</sub>	Maximum Input Leakage Current	5.5		±0.1	μA	V <sub>I</sub> = V <sub>CC</sub> , GND
I <sub>OLD</sub>	†Minimum Dynamic Output Current	5.5		75	mA	V <sub>OLD</sub> = 1.65 V Max
I <sub>OHD</sub>		5.5		-75	mA	V <sub>OHD</sub> = 3.85 V Min
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5		4.0	μA	V <sub>IN</sub> = V <sub>CC</sub> or GND

\* All outputs loaded; thresholds on input associated with output under test.

† Maximum test duration 2.0 ms, one output loaded at a time.

Note: I<sub>IN</sub> and I<sub>CC</sub> @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V<sub>CC</sub>.

# MC74AC10 MC74ACT10

**AC CHARACTERISTICS** (For Figures and Waveforms — See Section 3)

Symbol	Parameter	$V_{CC}^*$ (V)	74AC			74AC		Unit	Fig. No.		
			$T_A = +25^\circ C$ $C_L = 50 \text{ pF}$			$T_A = -40^\circ C$ to $+85^\circ C$ $C_L = 50 \text{ pF}$					
			Min	Typ	Max	Min	Max				
$t_{PLH}$	Propagation Delay	3.3 5.0	1.5 1.5	6.0 4.5	9.5 7.0	1.0 1.0	10.5 8.0	ns	3-5		
$t_{PHL}$	Propagation Delay	3.3 5.0	1.5 1.5	5.5 4.0	8.5 6.0	1.0 1.0	10.0 6.5	ns	3-5		

\* Voltage Range 3.3 V is  $3.3 \text{ V} \pm 0.3 \text{ V}$ .  
Voltage Range 5.0 V is  $5.0 \text{ V} \pm 0.5 \text{ V}$ .

## DC CHARACTERISTICS

Symbol	Parameter	$V_{CC}$ (V)	74ACT		74ACT		Unit	Conditions		
			$T_A = +25^\circ C$		$T_A = -40^\circ C$ to $+85^\circ C$					
			Typ	Guaranteed Limits						
$V_{IH}$	Minimum High Level Input Voltage	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0		V	$V_{OUT} = 0.1 \text{ V}$ or $V_{CC} - 0.1 \text{ V}$		
$V_{IL}$	Maximum Low Level Input Voltage	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8		V	$V_{OUT} = 0.1 \text{ V}$ or $V_{CC} - 0.1 \text{ V}$		
$V_{OH}$	Minimum High Level Output Voltage	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4		V	$I_{OUT} = -50 \mu\text{A}$		
		4.5 5.5		3.86 4.86	3.76 4.76		V	$*V_{IN} = V_{IL} \text{ or } V_{IH}$ $I_{OH} = -24 \text{ mA}$		
$V_{OL}$	Maximum Low Level Output Voltage	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1		V	$I_{OUT} = 50 \mu\text{A}$		
		4.5 5.5		0.36 0.36	0.44 0.44		V	$*V_{IN} = V_{IL} \text{ or } V_{IH}$ $I_{OL} = 24 \text{ mA}$		
$I_{IN}$	Maximum Input Leakage Current	5.5		$\pm 0.1$	$\pm 1.0$		$\mu\text{A}$	$V_I = V_{CC}, \text{ GND}$		
$\Delta I_{CCT}$	Additional Max. $I_{CC}$ /Input	5.5	0.6		1.5		$\text{mA}$	$V_I = V_{CC} - 2.1 \text{ V}$		
$I_{OLD}$	†Minimum Dynamic Output Current	5.5			75		$\text{mA}$	$V_{OLD} = 1.65 \text{ V Max}$		
		5.5			-75		$\text{mA}$	$V_{OHD} = 3.85 \text{ V Min}$		
$I_{CC}$	Maximum Quiescent Supply Current	5.5		4.0	40		$\mu\text{A}$	$V_{IN} = V_{CC} \text{ or GND}$		

\* All outputs loaded; thresholds on input associated with output under test.

† Maximum test duration 2.0 ms, one output loaded at a time.

# MC74AC10 MC74ACT10

**AC CHARACTERISTICS** (For Figures and Waveforms — See Section 3)

Symbol	Parameter	V <sub>CC</sub> * (V)	74ACT			74ACT		Unit	Fig. No.		
			T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF			T <sub>A</sub> = -40°C to +85°C C <sub>L</sub> = 50 pF					
			Min	Typ	Max	Min	Max				
t <sub>PLH</sub>	Propagation Delay	5.0	1.0		9.0	1.0	10.0	ns	3-5		
t <sub>PHL</sub>	Propagation Delay	5.0	1.0		9.0	1.0	9.5	ns	3-5		

\* Voltage Range 5.0 V is 5.0 V ±0.5 V.

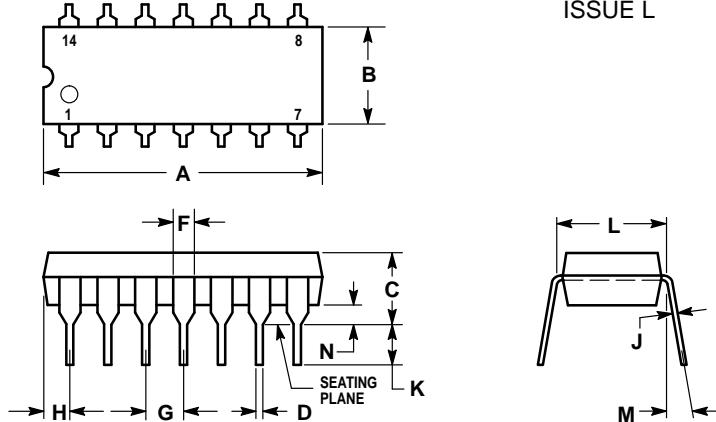
## CAPACITANCE

Symbol	Parameter	Value Typ	Unit	Test Conditions
C <sub>IN</sub>	Input Capacitance	4.5	pF	V <sub>CC</sub> = 5.0 V
C <sub>PD</sub>	Power Dissipation Capacitance	25	pF	V <sub>CC</sub> = 5.0 V

# MC74AC10 MC74ACT10

## OUTLINE DIMENSIONS

**N SUFFIX**  
PLASTIC DIP PACKAGE  
CASE 646-06  
ISSUE L

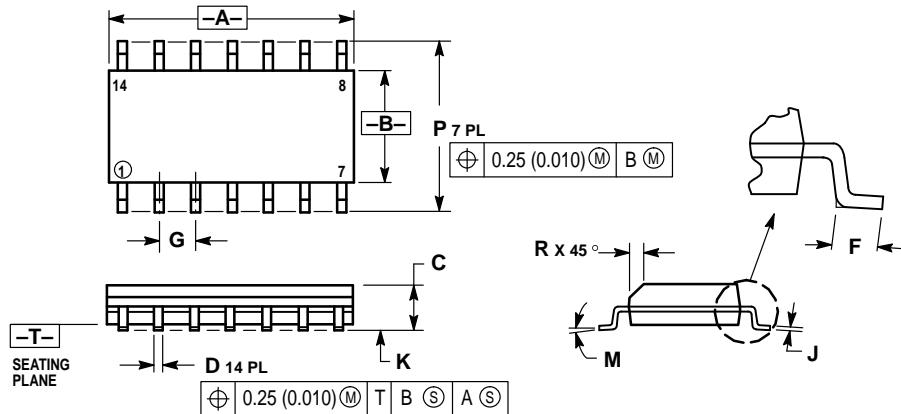


NOTES:

- LEADS WITHIN 0.13 (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.
- DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
- DIMENSION B DOES NOT INCLUDE MOLD FLASH.
- ROUNDED CORNERS OPTIONAL.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.715	0.770	18.16	19.56
B	0.240	0.260	6.10	6.60
C	0.145	0.185	3.69	4.69
D	0.015	0.021	0.38	0.53
F	0.040	0.070	1.02	1.78
G	0.100 BSC		2.54 BSC	
H	0.052	0.095	1.32	2.41
J	0.008	0.015	0.20	0.38
K	0.115	0.135	2.92	3.43
L	0.300 BSC		7.62 BSC	
M	0°	10°	0°	10°
N	0.015	0.039	0.39	1.01

**D SUFFIX**  
PLASTIC SOIC PACKAGE  
CASE 751A-03  
ISSUE F



NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: MILLIMETER.
- DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
- MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
- DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.55	8.75	0.337	0.344
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.228	0.244
R	0.25	0.50	0.010	0.019

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**How to reach us:**

**USA/EUROPE:** Motorola Literature Distribution;  
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

**MFAX:** RMFAX0@email.sps.mot.com -TOUCHTONE (602) 244-6609  
**INTERNET:** <http://Design-NET.com>

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,  
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

**HONG KONG:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

